

CM WHAT IS CLAIMED IS:

1. An improved battery comprising:
- (a) a rechargeable or nonrechargeable battery; and
 - (b) a battery-strength indicator means to indicate the strength of the battery when electrically connected to the battery.
2. The improved battery according to Claim 1 including a switch means adapted in an "on" position to electrically connect and complete a circuit between the battery and the indicator means.
3. The improved battery according to Claim 1 wherein the battery-strength indicator means comprises:
- (a) a nonconductive base layer;
 - (b) a nonconductive top layer attached to the base layer, a portion of the top layer and base layer forming a chamber therebetween;
 - (c) first and second conductive means separately and independently positioned between the top layer and the base layer and extending into the chamber, the first conductive means attachable to the battery, the second conductive means attached to the indicator means; and
 - (d) indicator means in said chamber adapted to undergo a visible change when subject to at least a predetermined voltage value.
4. The improved battery according to claim 3 wherein said top layer is transparent about the chamber.

5. The improved battery according to claim 3 wherein the top layer about the chamber is translucent.

6. The improved battery according to claim 3 wherein the indicator means is a chemical redox composition which changes color when the voltage potential across the electrodes crosses a predetermined voltage.

7. The improved battery according to claim 3 wherein the indicator means is a liquid-crystal composition that changes phases when the electric field across the chamber exceeds a predetermined value.

8. The improved battery according to claim 1 wherein the indicator means comprises:

- (a) a first nonconductive layer;
- (b) a second nonconductive layer attached to the first layer, a portion of the first and second layers forming a chamber therebetween, said chamber having first and second internal opposing walls;
- (c) a third nonconductive layer having a high-dielectric constant attached to the first internal wall of said chamber;
- (d) a first conductive plate means between the first internal wall and the third nonconductive layer;
- (e) a second conductive plate means on the second internal wall;

(f) a first and second conductive means separately and independently positioned between the first and second nonconductive layers, the first and second conductive means electrically connected to the first and second conductive plate means, the first and second conductive means adapted to be electrically connected to the opposite poles of a battery to complete a circuit;

(g) a liquid-crystal composition in said chamber adapted to undergo a visible phase change when the electric field between the first and second plate means crosses a predetermined value.

9. The improved battery according to claim 8 wherein said first layer is transparent about the chamber. ✓

10. The improved battery according to claim 9 wherein said first layer about the chamber is translucent. ✓

11. An improved battery comprising:

(a) a battery;

(b) a battery-strength indicator means to indicate the strength of the battery when electrically connected to the battery and comprising;

(i) a first non-conductive layer;

(ii) a second non-conductive layer attached to the first layer, a portion of the first and second layers forming a chamber therebetween, said chamber having first and second internal opposing walls;

(iii) a third non-conductive layer having a

high-dielectric constant attached to the first internal wall of said chamber;

(iv) a first conductive plate means sandwiched between the third nonconductive layer and the first internal wall;

(v) a second conductive plate means on the second internal wall;

(vi) first and second conductive means separately and independently positioned between the first and second non-conductive layers and electrically connected to the first and second conductive plate means, the first and second conductive means adapted to be electrically connected to the battery; and

(d) a liquid-crystal composition in said chamber adapted to undergo a visible phase change when the electric field between the first and second plate means crosses a predetermined value.

12. The improved battery according to claim 11, wherein said top layer is transparent about the chamber.

13. The improved battery according to claim 11, wherein the top layer about the chamber is translucent.

14. A switch means comprising:

(a) a nonconductive base layer;

(b) a resilient nonconductive top layer attached to the base layer, a portion of the base layer and top layer forming a chamber having two spaced apart internal opposing walls;

(c) a first contact means on one of the internal walls of

the chamber;

(d) a second contact means on the other internal wall of the chamber; and

(e) first and second conductive means independently and separately sandwiched between the top and base layers and connected respectively to the first and second contact means, the top layer about the chamber adapted to be pushed toward the base layer so that the first and second contact means come in contact to permit current flow from the first conductive means to the second conductive means.

15. An electrical switch comprising:

(a) a nonconductive base layer;

(b) a resilient nonconductive top layer attached to the base layer, a portion of the base layer and top layer forming a chamber having two spaced apart, internal opposing walls;

(c) first and second spaced apart conductive contact means on one of the internal walls of the chamber;

(d) a third conductive contact means on the other internal wall of the chamber; and

(e) first and second conductive means independently and separately sandwiched between the top and base layers and connected respectively to the first and second conductive contact means, the top layer about the chamber adapted to be pushed toward the base layer so that the third conductive contact means contacts the first and second conductive contact means to complete an electrical connection between the first and second contact means.

16. A battery-strength indicator device comprising:

- (a) a first nonconductive layer;
- (b) a second nonconductive layer attached to the first conductive layer, a portion of said first and second nonconductive layers forming a chamber therebetween;
- (c) a conductive layer sandwiched between said first and second nonconductive layers, the conductive layer reduced to a small cross-sectional area in the chamber; and
- (d) a heat-sensitive color-indicating material in said chamber that is adapted to undergo a color change when its temperature crosses a predetermined value, the conductive layer in the chamber rising to the predetermined temperature when the voltage of the current flowing therethrough exceeds a predetermined value.

17. The improved battery according to claim 15 wherein said first layer is transparent about the chamber. ✓

18. The improved battery according to claim 15 wherein said first layer about the chamber is translucent. ✓

19. A battery-strength indicator device comprising:

- (a) a first nonconductive layer;
- (b) a second nonconductive layer attached to the first nonconductive layer, a portion of said first and second nonconductive layers forming in part a chamber therebetween having spaced apart internal opposing walls;
- (c) a conductive layer sandwiched between said first and

second nonconductive layers, the conductive layer reduced to a small cross-sectional area in the chamber; and

(d) a pyrotechnic material contained within said chamber adapted to decompose when the temperature of the conductive layer in the chamber exceeds a predetermined temperature, the conductive layer in the chamber adapted to exceed said predetermined temperature when the voltage of the current through said conductive layer exceeds a predetermined value.

20. The improved battery according to claim 19 wherein said first layer is transparent about the chamber.

21. The improved battery according to claim 19 wherein said first layer about the chamber is translucent.

22. A battery-strength indicator device comprising:

(a) a first nonconductive layer;

(b) a second non-conductive layer attached to the first non-conductive layer, a portion of said first and second non-conductive layers forming a chamber therebetween having spaced apart internal opposing walls; and

(c) a conductive layer sandwiched between said first and second non-conductive layers, a portion of the conductive layer reduced to a small cross-sectional area in the chamber such that when the voltage of a current flow through the conductive layer in the chamber exceeds a predetermined value, the current flow through said conductive layer in the chamber raises the temperature of the

conductive layer in the chamber to the melting point of the conductive layer, causing the conductive layer to melt and form an open circuit.

23. The improved battery according to claim 22 ✓ wherein said first layer is transparent about the chamber.

24. The improved battery according to claim 22 ✓ wherein said first layer about the chamber is translucent.

25. An improved battery package having a battery-strength indicator means comprising:

(a) at least one battery;

(b) a battery-strength indicator means comprising;

(i) a battery-strength indicator device attached to the battery, said indicator device indicating the strength of said battery when electrically connected to said battery; and

(ii) conductive means adapted to electrically connect said indicator device to said battery; and

(c) packaging means for said battery and battery strength indicator means.

26. The improved battery according to Claim 25 ✓ including switch means electrically connected to said conductive means and adapted to complete the electrical circuit between the battery and the indicator device.

27. The battery-strength indicator means according to claim 26 ✓ which comprises:

- (a) a nonconductive base layer;
- (b) a nonconductive top layer attached to the base layer, the top layer and base layer forming a chamber therebetween having spaced apart internal opposing walls;
- (c) first and second conductive means separately and independently positioned between the top layer and the base layer and extending into the chamber, the first conductive means attached to the switch means, the second conductive means attached to the indicator means; and
- (d) indicator means in said chamber adapted to undergo a visible change when the voltage potential across the chamber crosses a predetermined voltage value.

28. The improved battery according to claim 27 wherein said top layer is transparent about the chamber.

29. The improved battery according to claim 27 wherein the top layer about the chamber is translucent.

30. The improved battery according to claim 27 wherein the indicator means is a chemical redox composition which changes color when the voltage potential across the chamber crosses a predetermined voltage.

31. The improved battery according to claim 27 wherein the indicator means is a liquid-crystal composition that changes phases when the electric field across the chamber exceeds a predetermined

value.

32. The improved battery according to Claim 25 wherein the battery strength indicator device is a LED that undergoes a visible change when the voltage applied to the LED crosses a predetermined value.

33. The improved battery according to Claim 32 including switch means electrically connected to said conductive means and adapted to complete the electrical circuit between the battery and the indicator device.

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